

REMARKS

The present application was filed on October 18, 1999 with claims 1-18. New claims 19-27 were added in a Preliminary Amendment filed by Applicants on August 30, 2000. Claims 1-27 are currently pending. Claims 1, 8, 15-19 and 24 are the independent claims.

In the Office Action dated October 3, 2002, the Examiner objected to FIG. 6A of the drawings and a corresponding portion of the specification, rejected claims 1-5, 7-12, 14, 15, 17 and 18 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,400,966 (hereinafter "Andersson"), and rejected claims 6, 13, 16 and 19-27 under 35 U.S.C. §103(a) as being unpatentable over Andersson in view of unspecified "knowledge generally available to one of ordinary skill in the art."

In this response, Applicants amend the drawings and specification to address the objections raised by the Examiner, amend claims 1 and 16, and traverse the §102(e) and §103(a) rejections. Applicants respectfully request reconsideration of the present application in view of the above amendments and the following remarks.

With regard to the objection to the drawings and specification, Applicants submit herewith a proposed red-lined drawing change to FIG. 6A. It is believed that the drawing change in conjunction with the amendment to the specification overcomes the objection raised by the Examiner.

With regard to the amendment to claims 1 and 16, this amendment corrects a minor error of a typographical nature. No new matter has been added.

As noted above, each of the independent claims 1, 8, 15, 17 and 18 stands rejected under §102(e) as being anticipated by Andersson.

Applicants initially note that MPEP §2131 specifies that a given claim is anticipated "only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference," citing Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, MPEP §2131 indicates that the cited reference must show the "identical invention . . . in as complete detail as is contained in the . . . claim," citing Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Applicants respectfully traverse the § 102(e) rejection on the ground that Andersson fails to teach or suggest each and every limitation of at least independent claims 1, 8, 15, 17 and 18, as will be described in greater detail below.

With regard to claim 1, this claim is directed to a wireless communication system base station having a plurality of channel unit boards. Each of the channel unit boards includes a plurality of channel elements for providing processing operations for signals assigned to multiple carriers of the communication system. In addition, the claim specifies that each of at least a subset of the channel elements of at least one of the channel unit boards is assignable to each of a plurality of carriers of the system.

The present invention as set forth in claim 1 is directed to a type of multi-carrier channel pooling arrangement which is distinct from the conventional single-carrier channel pooling arrangements of the prior art. The claimed arrangement can be configured in an illustrative embodiment to provide numerous advantages relative to conventional single-carrier channel pooling, as is described as follows in the specification at page 8, lines 14-24:

Advantageously, the above-described multi-carrier/multi-sector channel pooling arrangement provides substantially improved flexibility relative to the conventional single-carrier/multi-sector approach. More particularly, the channel pooling of the present invention allows any channel element to be assigned to any carrier sector in the system. For example, the channel pooling of the present invention can allow all the channel elements of a given channel unit board to be assigned to a single carrier, or each channel element to be assigned to a different one of K carriers, where $K \leq N$, or any of a number of other combinations. The invention can thus allow a given base station design to support different wireless communication standards using the same base station hardware. The invention also protects the investments of base station equipment purchasers, by allowing existing equipment to be easily and efficiently upgraded to provide additional capacity, or to support changes in operating standards.

With regard to independent claims 17 and 18, each of these claims includes a limitation relating to the provision of a multi-carrier channel pooling arrangement. As indicated above, the BBTX units of the Andersson reference, specifically relied upon by the Examiner in formulating the §102(e) rejection, are not configured to provide a multi-carrier channel pooling arrangement. Instead, the BBTX units of Andersson are disclosed as providing a single-carrier channel pooling arrangement which includes “a separate pool of BBTX resources for each carrier” (Andersson, column 10, lines 14-15).

Independent claims 16, 19 and 24 stand rejected under §103(a) as being unpatentable over Andersson.

With regard to independent claim 16, this claim includes limitations similar to those of claim 1, and is believed to be allowable for substantially the reasons identified above with regard to claim 1.

With regard to independent claim 19, this claim calls for a base station having a plurality of channel unit boards each including a plurality of channel elements for providing processing operations for signals transmitted by the system, and a controllable signal combiner element coupled to at least a subset of the plurality of channel unit boards. The controllable signal combiner element implements an assignment of signals from each of at least a subset of the channel elements of a given one of the channel unit boards for transmission on one or more of a plurality of carriers of the system. The Examiner again relies on the BBTX units of Andersson as meeting the claimed channel unit boards (Office Action, page 6, first paragraph). As indicated above, the BBTX units of the Andersson reference are disclosed as providing a single-carrier channel pooling arrangement which includes “a separate pool of BBTX resources for each carrier” (Andersson, column 10, lines 14-15), and thus fail to meet the limitations of claim 19.

Dependent claims 20-23 are believed allowable for at least the reasons identified above with regard to claim 19.

With regard to independent claim 24, this claim is directed to a base station having a plurality of channel unit boards each including a plurality of channel elements for providing processing operations for signals received by the system. The claim further calls for a controllable selector associated with a given one of the channel unit boards and receiving as inputs a set of signals

how many are "a subset" of

The Examiner in formulating the §102(e) rejection of claim 1 argues that each and every limitation of claim 1 is disclosed by the Andersson reference. More particularly, the Examiner argues with reference to FIG. 9A of Andersson that the claimed channel unit boards correspond to the elements BBTX-1, BBTX-2, ..., BBTX-N, and the claimed channel elements correspond to the resources within a given one of the BBTX units (Office Action, page 3, section 6). Applicants respectfully disagree. As noted above, in the present invention as set forth in claim 1, each of at least a subset of the channel elements of at least one of the channel unit boards is assignable to each of a plurality of carriers of the system. This limitation is not met in the portion of Andersson relied upon by the Examiner. For example, none of the resources in a given one of the BBTX units in Andersson FIG. 9A is assignable to each of a plurality of carriers of the system, as required by the express limitations of claim 1. Instead, a given one of these resources is associated with only one of the carriers of the system. This is apparent from FIG. 9A itself, which shows a different set of resources 1 through M6 being associated with each of the carriers 1 through N1. Moreover, the associated description at column 10, lines 14-15 specifically states as follows, with emphasis supplied:

In FIG. 9A, the BBTX hardware sub-unit (216) has a separate pool of BBTX resources for each carrier.

This is clearly a type of conventional single-carrier channel pooling, and fails to anticipate the multi-carrier channel pooling arrangement of claim 1.

Applicants therefore submit that independent claim 1 is not anticipated by Andersson. Dependent claims 2-7 are believed allowable for at least the reasons identified above with regard to claim 1.

With regard to independent claims 8 and 15, each of these claims includes limitations similar to those of claim 1, and is believed to be allowable for substantially the reasons identified above with regard to claim 1. Dependent claims 9-14 are believed allowable at least by virtue of their dependence from claim 8.

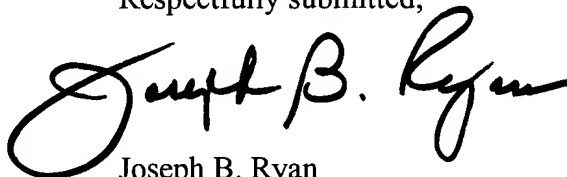
associated with a receive bus of the system, the controllable selector having a plurality of outputs, each coupled to a corresponding input of one of the channel elements of the given channel unit board. In addition, the controllable selector implements an assignment of received signals from each of a plurality of carriers of the system to each of at least a subset of the channel elements of the given channel unit board. The Examiner relies upon the arguments advanced with regard to claim 19 (Office Action, page 6, second paragraph). However, as indicated above, the arguments advanced with regard to claim 19 rely on the BBTX units of Andersson, which fail to teach or suggest a multi-carrier channel pooling arrangement of the type claimed.

Dependent claims 25-27 are believed allowable for at least the reasons identified above with regard to claim 24.

Attached hereto is a marked-up version of the changes made by the present Amendment.

In view of the above, Applicants believe that claims 1-27 are in condition for allowance, and respectfully request the withdrawal of the §102(e) and §103(a) rejections.

Respectfully submitted,



Date: December 30, 2002

Joseph B. Ryan
Attorney for Applicant(s)
Reg. No. 37,922
Ryan, Mason & Lewis, LLP
90 Forest Avenue
Locust Valley, NY 11560
(516) 759-7517

Enclosure(s): Proposed Red-Lined Drawing Change - 1 Sheet

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

The paragraph beginning at page 7, line 28, has been amended as follows:

FIGS. 6A and 6B illustrate in greater detail the manner in which the N channel elements 202-*j* of the channel unit board 200 are combined in the receive direction. In the receive direction, a single broadcast bus per carrier is used to interface a set of radio boards 232 with M channel unit boards each supporting up to N channel elements in the multi-carrier/multi-sector channel pool. In a base station 235 with the set of radio boards 232 and multiple channel unit boards 200-1 (CUB 1), 200-2 (CUB 2), . . . , 200-M (CUB M), each channel unit board will interface to the same I/Q bus, as shown in FIG. 6A. The I/Q bus in such an arrangement is comprised of N carrier/sectors, i.e., the total number of carrier and sector combinations is N. For example, for a six-carrier, three-sector channel pool, a 36-wire I/Q bus can be configured to provide one bit for I and one bit for Q at a specified clock rate. At the input of a given one of the channel unit boards 200, an I/Q bus selector 240, in response to an I/Q routing control signal, connects the correct carrier/sector I/Q bus to the channel elements 202-1, 202-2, . . . , 202-N, as shown in FIG. 6B.

IN THE CLAIMS

1. (Amended) A base station for use in a wireless communication system, comprising:
a plurality of channel unit boards each including a plurality of channel elements for providing processing operations for signals assigned to multiple carriers of the communication system, wherein each of at least a subset of the channel elements of at least one of the channel unit boards [are] is assignable to each of a plurality of carriers of the system.

16. (Amended) A base station for use in a wireless communication system, comprising:
a plurality of channel unit boards each including a plurality of channel elements for providing processing operations for signals assigned to multiple carriers of the communication

system, wherein each of at least a subset of the channel elements of at least one of the channel unit boards [are] is assignable to each of a plurality of carriers of the system; and

a control computer coupled to at least a subset of the plurality of channel unit boards, the control computer being operative to assign the channel elements of the channel unit boards to particular ones of the carriers of the system.